Silver Series EM Operator Interface Terminal

Watlow® Offers the Silver Series EM Operator Interface Terminal to Give Your System an Easy-to-Use Interface with E-Mail Messaging

The Silver Series EM is a rugged, touchscreen operator interface terminal (OIT). Available in three sizes (4.3, 7 and 10 inch diagonal display sizes), the OIT's feature serial and Ethernet communications with multiple controllers, e-mail messaging, universal serial bus (USB host), data logging, flexible password security and multiple languages. The small bezel size and two-inch depth make mounting in tight spots easy.

The Silver Series EM programming software, EZwarePlus, is easy to use and features a large variety of built-in screen objects that makes it powerful. When creating screens, the user can call upon extensive graphics libraries, import custom graphics and add numeric displays, entry fields, analog meters, bar graphs and trend graphs with just a few mouse clicks. Screen objects are highly customizable, and the user can create libraries of their own objects for repeat use. The online simulator, Ethernet and USB support make testing and downloading fast. The EZwarePlus screen editor is part of the EZwarePlus software suite and is available as a FREE download on www.watlow.com and on the DVD-ROM found in the accessories list on page six.

The Silver Series EM OIT paired with Watlow® controllers is the perfect solution for your industrial process or machine control application.

Features and Benefits

Bright, color, high resolution, graphic, touchscreen, thin film transistor (TFT) display
- Maximizes display space in the OIT footprint
- Allows application specific interface design
- Allows viewing from a distance and at an angle
- Highlights important process information with color and animation

User selectable portrait or landscape operation
- Fits in tight spots

Ethernet, serial and USB host ports
- Allows options for connecting to controllers
- Provides options for downloading projects
- Expands memory for recipe and data log storage
- Supports barcode readers, keyboard, mouse and printers
- Supports monitoring from a personal computer (PC) with free VNC Client software

Support for over one hundred protocols, up to three simultaneously plus multiple protocols over Ethernet
- Connects to a wide range of industrial controllers and devices
- Integrates a variety of devices to simplify complex operation tasks

Data logging, display and trending
- Helps operators monitor processes
- Reduces labor and increases accuracy by automating time-stamped data collection
- Stores captured data for future retrieval in multiple files
- Saves time by exporting data to Excel®-compatible comma separated value (CSV) files
- Improves process understanding by allowing live and historical data to be viewed on the OIT

Alarm and event e-mail notification, monitoring and recording
- Reduces downtime by helping troubleshoot equipment and processes
- Simplifies troubleshooting by recording time and date-stamped alarm and event history
- Organizes and prioritizes alarms and events in up to 255 categories and 4 priority levels

Recipe management
- Reduces errors by automating process setting changes

Offline and online simulation
- Speeds up development by making it faster and easier to test projects
- Allows faster creation of fine-tuned interfaces by speeding up iterations

Time or trigger-based data exchange
- Simplifies integration by allowing the OIT to copy data from one controller or OIT to another

Internal, piezoelectric buzzer
- Provides audible alarms and key chirp

Two-year warranty
- Provides product support and reliability

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WATLOW®

ISO 9001
Registered Company
Winona, Minnesota USA

Features and Benefits (cont.)

Screen object password security with programmable hierarchy and multiple users

- Prevents errors and tampering by allowing only authorized users to access restricted items on the screen
- Allows flexible hierarchies by letting the developer assign each screen object to any of 12 groups and grant each user access to any combination of groups
- Provides password protection for upload, download and access to local setup
- Supports up to 127 users

Screen object invisibility and/or interlock control

- Prevents errors by guiding operators

Powerful, easy-to-use EZwarePlus, programming software

- Requires only a small investment in time to create a useful interface
- Provides the ability to learn additional features as needed
- Provides advanced interface features such as animation and pop-up windows
- Reduces development time by providing extensive graphical libraries and facilitating reuse with user-created libraries
- Simplifies development by allowing import of common graphic formats: bitmaps, JPEGs and animated GIFs

User-programmable macros with math functions and support for floating point

- Extends functionality
- Automates processes

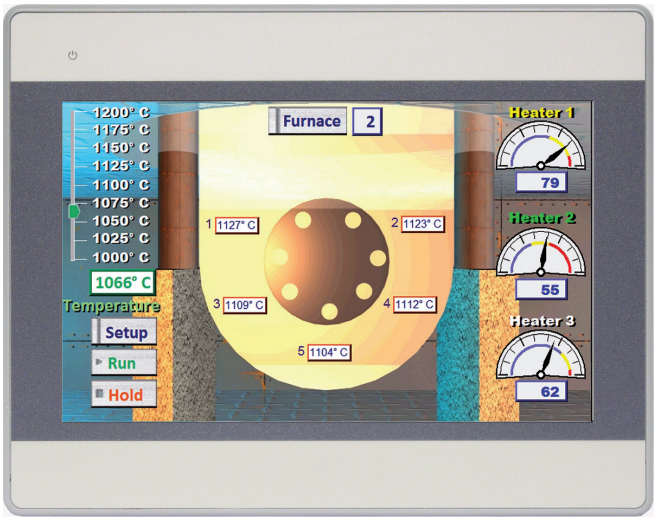
TrueType fonts with Unicode (international) characters and language switching feature

- Makes screens easy to read by allowing bold, italic, underlined, scrolling and blinking text to direct operator's eyes
- Prevents errors by communicating with users in their native languages
- Reduces development and support by allowing inclusion of up to 24 user-selectable languages in a project

UL®, NEMA 4, CE, RoHS

- Allows use in harsh industrial environments
- Assures prompt product acceptance

Integrate multiple devices to simplify operation of complex systems



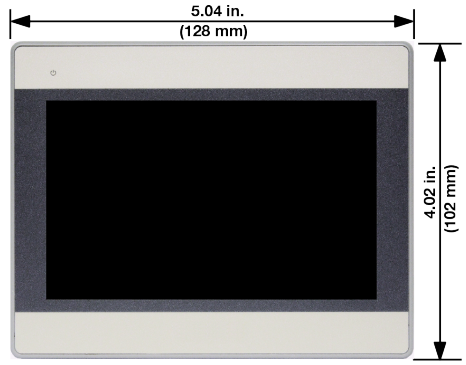
Include the types of displays users understand such as gauges, sliders and bar graphs to make screens intuitive

Log and graph process data for quality records and better process control

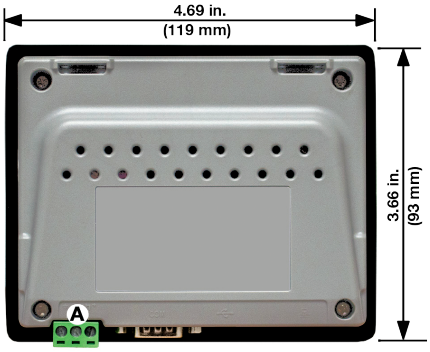
Create screens that guide work flow

Dimension and Connection Diagrams

Models TS00-0043-EM00/TS00-0043-EM0B

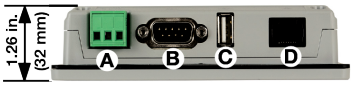


Front View



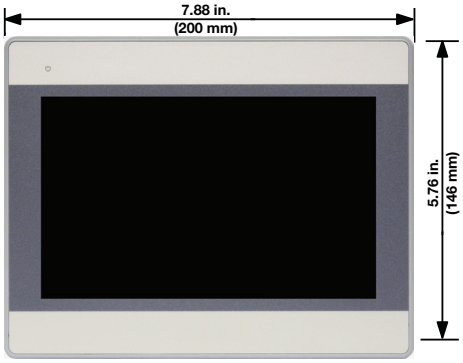
Rear View

A Power connector
B Serial ports
C USB host port
D Ethernet port

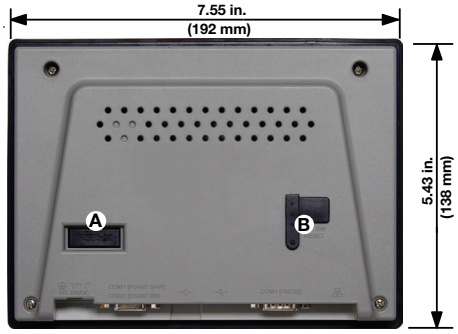


Bottom View

Model TS00-0070-EM00



Front View

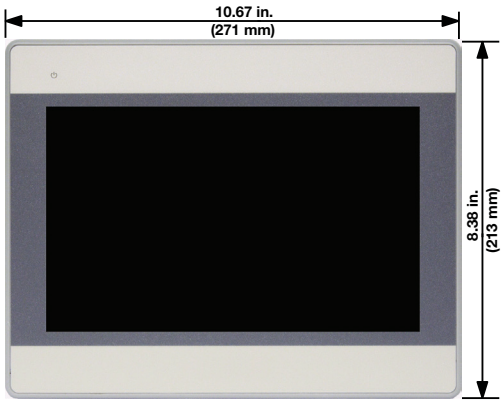


Rear View

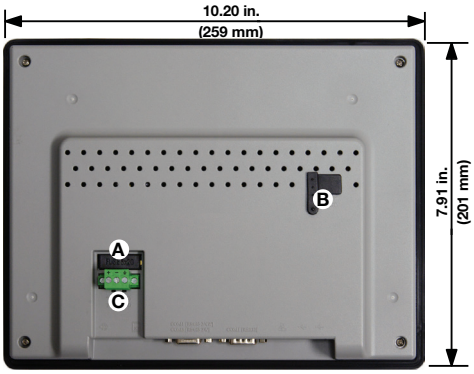
A Fuse
B Switches and reset button
C Power connector
D Serial ports
E USB host port
F Ethernet port

Bottom View

Model TS00-0100-EM00



Front View



Rear View

A Fuse
B Switches and reset button
C Power connector
D Serial ports
E Ethernet port
F USB host port

Bottom View

Specifications

	Model Number		
Feature	**TS00-0043-EM00/TS00-0043-EM0B**	**TS00-0070-EM00**	**TS00-0100-EM00**
Processor Type	600 MHz, 32-bit, RISC, fanless		
Memory	128MB Flash, 128MB DRAM		
Ethernet Port	10/100 Base-T (RJ45)		
Serial Ports	COM1: RS-232 or RS-485 (2-wire or 4-wire) COM3: RS-485 (2-wire)		
USB Host (Type A) Version 2.0	1 each		
Real Time Clock	Built-in		
Audible Alarm and Key Chirp	Piezoelectric buzzer		
Display Type	TFT LCD		
Resolution (Pixels)	480 x 272	800 x 480	
Colors	16 million		262 thousand
LED Backlight Brightness	500 cd/m^2	350 cd/m^2	300 cd/m^2
Contrast Ratio	500:1		
Viewing Angle	Top: 50°, bottom, right, left: 70°	Top: 60°, bottom, right, left: 70°	Top: 45°, bottom, right, left: 65°
Backlight Longevity	30,000 hours		
Touchscreen Type	4-wire analog resistive		
Touchscreen Resolution	Continuous		
Touchscreen Light Transmission	Greater than 80%		
Touchscreen Lifespan	1,000,000 activations min.		
Operating Temperature	32 to 122°F (0 to 50°C)		
Storage Temperature	-4 to 140°F (-20 to 60°C)		
Relative Humidity	10 to 90% @ 40°C (non-condensing)		
Operating Shock Resistance	10 to 25 Hz (X, Y, Z direction 2G, 30 min.)		
Environmental Ratings	NEMA 4 (IP65) indoor only		
Agency	CE, cULus, RoHS,		
Enclosure	Plastic molded		
Mounting	Panel		
Dimensions Cutout (W x H)	4.69 x 3.66 in. (119 x 93 mm)	7.55 x 5.43 in. (192 x 138 mm)	10.20 x 7.91 in. (259 x 201 mm)
Dimensions Overall (W x H x D)	5.04 x 4.02 x 1.26 in. (128 x 102 x 32 mm)	7.88 x 5.76 x 1.34 in. (200 x 146 x 34 mm)	10.67 x 8.38 x 1.57 in. (271 x 213 x 40 mm)
Weight	0.55 lbs (0.25 kg)	1.3 lbs (0.6 kg)	2.9 lbs (1.3 kg)
Input Power: Voltage	24VDC		
Input Power: Current	300mA max.	350mA max.	400mA max.

EZwarePlus Software System Requirements

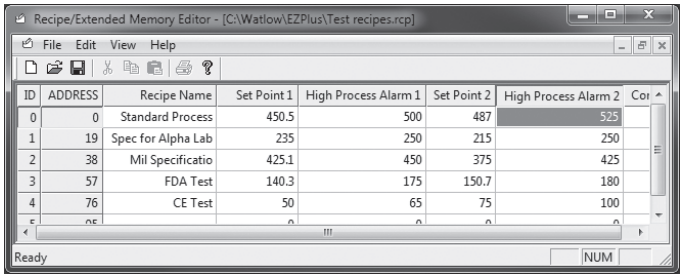
Compatible Operating Systems:

- Windows® 8, 7, Vista and XP

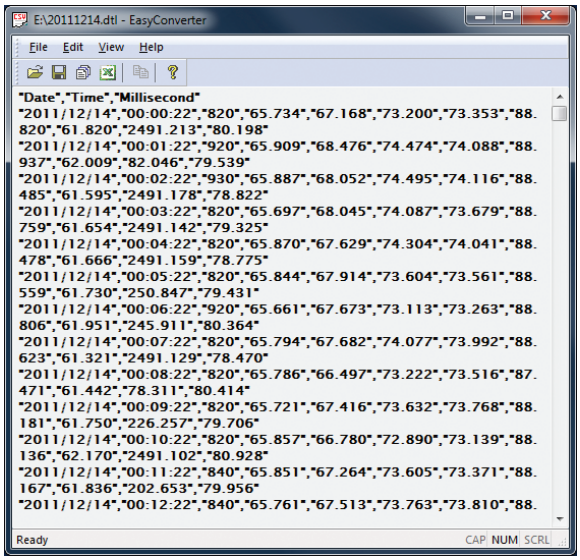
EZwarePlus Software Suite

The EZwarePlus software suite includes EasyConverter, EZwarePlus screen editor, Utility Manager and Recipe Editor programs.

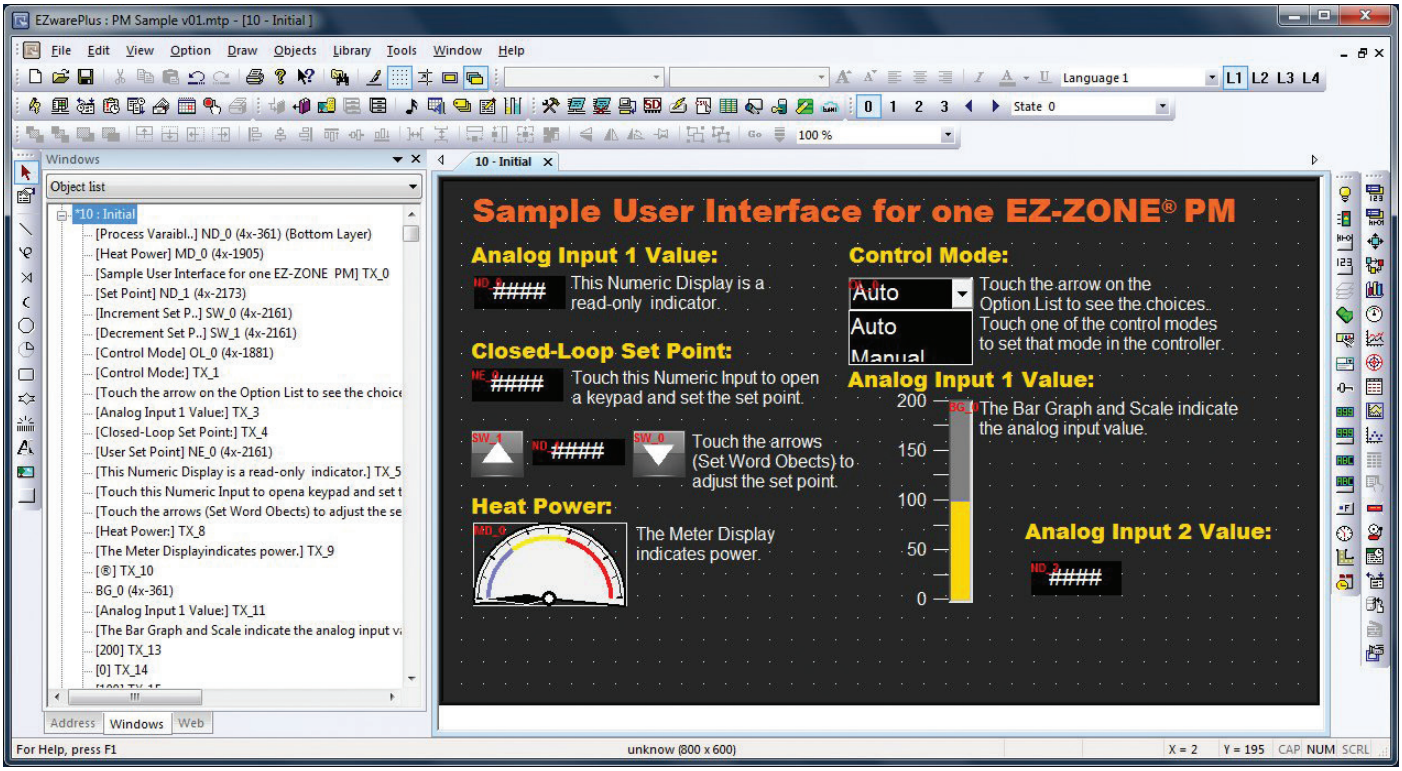
Utility Manager uploads and downloads projects to and from the Silver Series EM OIT, opens compiled projects in simulation and launches the other EZwarePlus programs.


Recipe/Extended Memory Editor - [C:\Watlow\EZPlus\Test recipes.rcp]
File Edit View Help
ID | ADDRESS | Recipe Name | Set Point 1 | High Process Alarm 1 | Set Point 2 | High Process Alarm 2
0 | 0 | Standard Process | 450.5 | 500 | 487 | 525
1 | 19 | Spec for Alpha Lab | 235 | 250 | 215 | 250
2 | 38 | Mil Specificatio | 425.1 | 450 | 375 | 425
3 | 57 | FDA Test | 140.3 | 175 | 150.7 | 180
4 | 76 | CE Test | 50 | 65 | 75 | 100
Ready
NUM

The Recipe Editor configures memory files for use with Silver Series EM OITs and allows offline creation of recipes.

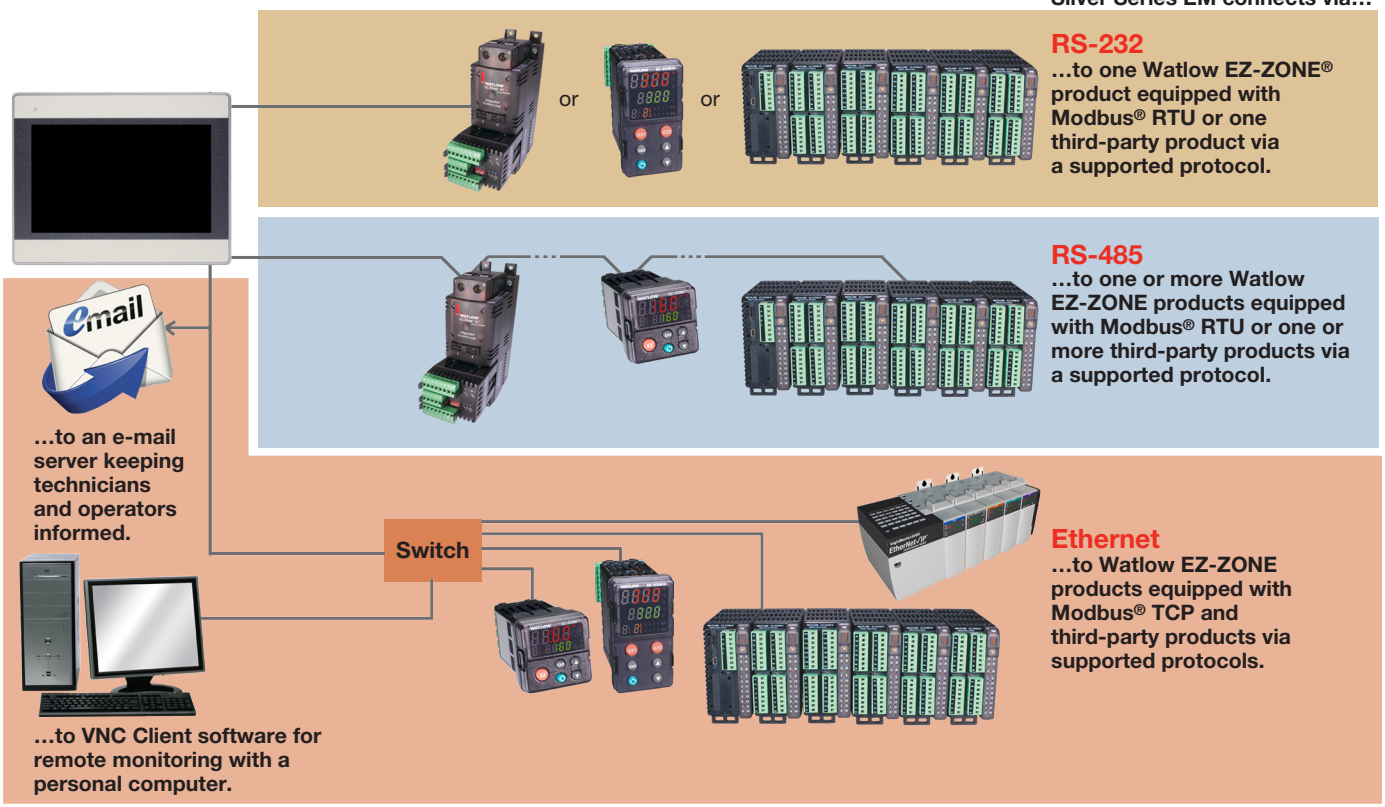


EasyConverter converts log files saved by the Silver Series EM OIT to file formats used by popular Window® software such as Microsoft® Excel.


EZwarePlus : PM Sample v01.mtp - [10 - Initial]
File Edit View Option Draw Objects Library Tools Window Help
Windows
Object list
10 : Initial
[Process Varaibl..] ND_0 (4x-361) (Bottom Layer)
[Heat Power] MD_0 (4x-1905)
[Sample User Interface for one EZ-ZONE PM] TX_0
[Set Point] ND_1 (4x-2173)
[Increment Set P..] SW_0 (4x-2161)
[Decrement Set P..] SW_1 (4x-2161)
[Control Mode] OL_0 (4x-1881)
[Control Mode:] TX_1
[Touch the arrow on the Option List to see the choice
[Analog Input 1 Value:] TX_3
[Closed-Loop Set Point:] TX_4
[User Set Point] NE_0 (4x-2161)
[This Numeric Display is a read-only indicator.] TX_5
[Touch this Numeric Input to opena keypad and set t
[Touch the arrows (Set Word Obects) to adjust the se
[Heat Power:] TX_8
[The Meter Displayindicates power.] TX_9
[®] TX_10
BG_0 (4x-361)
[Analog Input 1 Value:] TX_11
[The Bar Graph and Scale indicate the analog input v
[200] TX_13
[0] TX_14
Address Windows Web
10 - Initial
Sample User Interface for one EZ-ZONE® PM
Analog Input 1 Value:
####
This Numeric Display is a read-only indicator.
Control Mode:
Auto
Auto
Manual
Touch the arrow on the Option List to see the choices. Touch one of the control modes to set that mode in the controller.
Closed-Loop Set Point:
####
Touch this Numeric Input to open a keypad and set the set point.
Analog Input 1 Value:
200
150
100
50
0
The Bar Graph and Scale indicate the analog input value.
####
Touch the arrows (Set Word Obects) to adjust the set point.
Heat Power:
The Meter Display indicates power.
Analog Input 2 Value:
####
For Help, press F1
unknow (800 x 600)
X = 2
Y = 195
CAP NUM SCRL

EZwarePlus provides a graphical screen designing environment with point-and-click access to features and drag-and-drop ease.

Connectivity


Silver Series EM connects via…
RS-232
…to one Watlow EZ-ZONE® product equipped with Modbus® RTU or one third-party product via a supported protocol.
or
or
RS-485
…to one or more Watlow EZ-ZONE products equipped with Modbus® RTU or one or more third-party products via a supported protocol.
email
…to an e-mail server keeping technicians and operators informed.
Switch
Ethernet
…to Watlow EZ-ZONE products equipped with Modbus® TCP and third-party products via supported protocols.
…to VNC Client software for remote monitoring with a personal computer.

Ordering Information

Part Number	Description
TS00-0043-EM00	4.3 in. (480 x 272) color TFT LCD touchscreen; two-tone, light gray bezel; USB host; two serial ports and Ethernet
TS00-0043-EM0B	4.3 in. (480 x 272) color TFT LCD touchscreen; two-tone, dark gray bezel; USB host; two serial ports and Ethernet
TS00-0070-EM00	7 in. (800 x 480) color TFT LCD touchscreen; two-tone, light gray bezel; USB host; two serial ports and Ethernet
TS00-0100-EM00	10 in. (800 x 480) color TFT LCD touchscreen; two-tone, light gray bezel; USB host; two serial ports and Ethernet

Accessories

Part Number	Description
0601-0001-0000	Controller support tools DVD-ROM with programming software and product manuals
0830-0750-0000	Power supply, Input: 85-264VAC, Output: 24VDC, 1.7A, 40W (not Class 2)
0847-0299-0000	Class 2 power supply, Input: 90-264VAC, Output: 24VDC, 1.3A, 31W
0219-0388-0000	TS00-0043-EM00 and TS00-0043-EM0B communication cable, 5-foot, COM1 (RS-485, 2-wire) to bare wires for Watlow EZ-ZONE® controller screw terminals
0219-0374-0000	TS00-0070-EM00 or TS00-0100-EM00 communication cable, 5-foot, COM1 (RS-485, 2-wire) to bare wires for Watlow EZ-ZONE controller screw terminals
0830-0782-0000	Package of 5 ea. protective screen covers for the TS00-0043-EM00 and TS00-0043-EM0B
0830-0753-0000	Package of 5 ea. protective screen covers for the TS00-0070-EM00
0830-0754-0000	Package of 3 ea. protective screen covers for the TS00-0100-EM00

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